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SMART & BIGGAR
Suite 3400
1000 de la Gauchetiere Street West
Montreal, QC H3B 4W5
CANADA

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	09/915,332	DUPLAIX ET AL.
	Examiner	Art Unit
	Habte Mered	2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30,35,38-41,50-55 and 59-67* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30,35,38-41, 50-55 and 59-67* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

A. The amendment filed on 30 March 2007 has been entered and fully considered.

B. Claims 59-67 are newly added claims by the amendment filed on 13 September 2006. Claims 56-58 are cancelled by the amendment filed on 13 September 2006. Claims 31-34, 36-37, 42-49, have been previously cancelled.

C. Claims 1-30, 35, 38-41, 50-55 and 59-67 are pending. Claims 1 and 65 have been amended. Claims 1, 23, 35, 38, and 65 are the base independent claims.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. **Claims 1-30, 35, 50-55, and 59-67** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukakoshi et al (US 6, 577, 634), hereinafter referred to as Tsukakoshi, in view of Agarwal et al (US 6, 947, 963 B1), hereinafter referred to as Agarwal.

Tsukakoshi discloses a router device with route calculation units and forwarding units.

3. Regarding **claims 1 and 65**, Tsukakoshi discloses a router device with route calculation units and forwarding units. The route calculation unit has a CPU and memory and has two or more routing protocol means to handle different types of

protocols. Similarly the forwarding unit has a CPU as a forwarding processor and a memory unit. The router device's forwarding unit serves as the I/O unit and interfaces with external devices. The routing calculation unit constitutes the routing layer while the forwarding unit defines the I/O layer. The router device disclosed by Tsukakoshi is in effect a clustered router and appears to other external routers and communication terminals as a single network forwarding apparatus. **(See Column 3, Lines 62-67)**

Tsukakoshi discloses a router supporting multiple routing protocols **(See Column 3, Lines 18-20; Figure 1 element 15; Each routing calculation unit can handle two different routing protocols),** the router comprising:

a. an interface layer including a plurality of I/O controllers, each I/O controller implementing an I/O port; **(See Figure 1, element 18; Figure 4, element 18;Column 4, Lines 53-64; Each forwarding unit acts as an I/O controller determining what to transmit, re-transmit, accept and reject from the incoming and outgoing packet traffic. Each forwarding unit has to have at least one I/O interface or port to send to and receive packets from external routers like router 25 in Figure 1)**;

b. a switching layer in communication with the interface layer for selectively establishing signal pathways between I/O ports; **(See Figure 1, element 13; Figure 4, element 46; Column 4, Line 40)**

c. a routing layer in communication with the interface layer, and the routing layer including a plurality of routing protocol computing entities, each routing protocol computing entity being associated with a set of at least one routing protocol and including: **(Tsukakoshi discloses each router entity 12 in Figure 1 contains two or**

more routing protocol means 15 as shown in Figure 1. See Column 3, Line 19. Further, Tsukakoshi shows that each router entity 12 in Figure 1 can contain more than two routing protocol means 15 which can easily be verified in Figure 3 that there are three running different protocols – protocol A, B, and C. See Column 2, Lines 37-38 and Column 14, Lines 13-20.)

i. a CPU **(See element 41, Figure 4)**;

ii. a data storage medium in communication with the CPU **(See element 42, Figure 4)**;

iii. and storing program data executed by the CPU **(it is inherent for any processor designed to execute a series of procedures to store the instructions for executing the procedures in memory and in this case the program data has to be stored in the storage medium shown in Figure 4 as element 42);**

Tsukakoshi fails to cause routing protocol computing entity to effect management of one or more peering sessions with remote routing devices according to the at least one routing protocol in the set associated with routing protocol computing entity, the management of one or more peering sessions comprising maintaining in the data storage medium one or more route databases including routing data; wherein the set of at least one routing protocol associated with a first one of the routing protocol computing entities is different from the set of at least one routing protocol associated with a second one of the routing protocol computing entities; wherein the one or more route databases maintained in the data storage medium of the first one of the routing protocol computing entities contain information on at least one route for which there is no

<u>information in the one or more route databases maintained in the data storage medium of the second one of the routing protocol computing entities</u>; the router being operative for: merging the routing data included in the one or more route databases maintained in the data storage medium of each of the routing protocol computing entities to produce merged routing data; and transferring at least a portion of the merged routing data to the data storage medium of each of at least one of the routing protocol computing entities; producing merged routing data that includes data regarding destinations and routes for the destinations, including, for each of at least one of the destinations, a plurality of routes for that destination; and pruning the merged routing data by retaining, for each destination, at most a set number of routes for that destination.

Agarwal teaches methods and apparatus for synchronizing and propagating distributed routing databases for scalable router.

Agarwal discloses causing routing protocol computing entity to effect management of one or more peering sessions with remote routing devices according to the at least one routing protocol in the set associated with routing protocol computing entity **(See Figures 2, 3, and 8)**, the management of one or more peering sessions **(In Figure 2 peering session occurs between control cards A, B, C; In Figure 3 entity I with routing protocol A and entity IV with routing protocol B; See Column 7: 54-67 and Column 8:15-42)** comprising maintaining in the data storage medium one or more route databases **(See Figure 4, the Control Cards 30A and 30B running protocols A and B and Route Table A and B)** and including routing data; wherein the set of at least one routing protocol associated with a first one of the routing protocol computing

entities is different from the set of at least one routing protocol associated with a second one of the routing protocol computing entities **(See Figures 2, 3, and 4 – all control cards are capable running different or same protocols)**; <u>wherein the one or more route databases maintained in the data storage medium of the first one of the routing protocol computing entities contain information on at least one route for which there is no information in the one or more route databases maintained in the data storage medium of the second one of the routing protocol computing entities;</u> ***(Agarwal teaches in column 3:63-67 that each protocol on each processor generates protocol specific unique route information. Agarwal further shows in column 4:1-7 in item c that each processor running unique protocol exchanges data to form the master routing database. Agarwal in fact shows that in Column 3:9-11 that each processor has a copy of the master database which is created and synchronized by the exchange of protocol specific route data between the processors. At this point it is obvious that two forms of route information are generated and stored in each processor. The first is the local route information that has to be provided to all other processors running a complement of protocols different from the protocol on the processor that generated the local route information. Since the local route information has to be provided to other processors upon request it has to be stored. Whether the local route information is stored in a table or file or database is immaterial. Agarwal further provides support in Column 6:20-25 in item 3 that two separate database route information is created in each processor.)*** router being operative for merging the routing data

included in the one or more route databases maintained in the data storage medium of each of the routing protocol computing entities to produce merged routing data **(See Columns 2:44-54, 4:15-47 and 8:23-60)**; and transferring at least a portion of the merged routing data to the data storage medium of each of at least one of the routing protocol computing entities. **(See Figure 8, steps 804 and 808)** producing merged routing data that includes data regarding destinations and routes for the destinations, including, for each of at least one of the destinations, a plurality of routes for that destination **(See Column 6:40-45)**; and pruning the merged routing data by retaining, for each destination, at most a set number of routes for that destination **(See Column 6:52-67; As the Applicant's invention has the capability to send both pruned and non-pruned database as stated in the specification page 12, lines 14-15, Agarwal system sends the pruned database to the forwarding table and keeps the non-pruned version)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsukakoshi's clustered router by causing routing protocol computing entity to effect management of one or more peering sessions with remote routing devices according to the at least one routing protocol in the set associated with routing protocol computing entity, the management of one or more peering sessions comprising maintaining in the data storage medium one or more route databases including routing data; wherein the set of at least one routing protocol associated with a first one of the routing protocol computing entities is different from the set of at least one routing protocol associated with a second one of the routing protocol

computing entities; the router being operative for: merging the routing data included in the one or more route databases maintained in the data storage medium of each of the routing protocol computing entities to produce merged routing data; and transferring at least a portion of the merged routing data to the data storage medium of each of at least one of the routing protocol computing entities. The motivation being to provide a method for all distribution and synchronization of the routing database and forwarding table to a large number of entities within a distributed processor environment of a scalable router as stated in Agarwal in Column 3:19-22.

4. Regarding **claim 23**, Tsukakoshi discloses a router, comprising:

a. an interface layer including a plurality of I/0 controllers, each I/O controller implementing an I/O port (**See Figure 1, element 18; Figure 4, element 18;Column 4, Lines 53-64; Each forwarding unit acts as an I/O controller determining what to transmit, re-transmit, accept and reject from the incoming and outgoing packet traffic. Each forwarding unit has to have at least one I/O interface or port to send to and receive packets from external routers like router 25 in Figure 1**);

b. a switching layer in communication with the interface layer for selectively establishing signal pathways between the I/O ports **(See Figure 4, element 46; Column 4, Line 40);**

C. a routing layer in communication with the interface layer, the routing layer including a plurality of routing protocol computing entities, each routing protocol computing entity being associated with a routing protocol **(See Column 4, Lines 39-52)** and including:

i. a CPU **(See element 41, Figure 4)**;

ii. a data storage medium in communication with the CPU **(See element 42, Figure 4)**; and storing program data for execution by the CPU **(it is inherent for any processor designed to execute a series of procedures to store the instructions for executing the procedures in memory and in this case the program data has to be stored in the storage medium shown in Figure 4 as element 42)** to cause the routing protocol computing entity to effect management of one or more peering sessions with remote routing devices according to the routing protocol associated with the routing protocol computing entity **(Tsukakoshi discloses the clustered router is seen as a single entity by external devices like router 25 in Figure 1. Tsukakoshi further discloses that a communication or peering session can be established between the clustered router and any device like router 25 to continuously exchange packets. Each router unit in the clustered router can have a peering session with remote devices using the first and/or second protocol means. See also Column 2, Lines 11-15; Column 3, Lines 62-67; and Column 4, Lines 1-5.)**, the management of one or more peering sessions comprising maintaining in the data storage medium one or more route databases **(See Figure 1, elements 17; See Column 8, Lines 48-50 and Column 3, Lines 20-26; Tsukakoshi shows that each routing protocol means that runs a specific routing protocol during a peering session extracts specific network routing information and puts it in element 16 of Figure 1 and then creates a routing table)**.

Tsukakoshi fails to cause routing protocol computing entity to effect management of one or more peering sessions with remote routing devices according to the routing

protocol in the set associated with routing protocol computing entity, the management of one or more peering sessions comprising maintaining in the data storage medium one or more route databases; wherein the routing protocol associated with a first one of the routing protocol computing entities is the same as the routing protocol associated with a second one of the routing protocol computing entities; wherein the one or more route databases maintained in the data storage medium of first one of the routing protocol computing entities contain information on at least one route for which there is no information in the one or more route databases maintained in the data storage medium of the second one of the routing protocol computing entities.

Agarwal discloses causing routing protocol computing entity to effect management of one or more peering sessions with remote routing devices according to the routing protocol in the set associated with routing protocol computing entity **(See Figures 2, 3, and 4)**, the management of one or more peering sessions **(In Figure 2 peering session occurs between control cards A, B, C; In Figure 3 entity I with routing protocol A and entity IV with routing protocol B; See Column 7:54-57 and Column 8:15-42)** comprising maintaining in the data storage medium one or more route databases **(See Figure 4, the Control Cards 30A and 30B running protocols A and B and Route Table A and B)**; wherein the routing protocol associated with a first one of the routing protocol computing entities is the same as the routing protocol associated with a second one of the routing protocol computing entities **(In Agarwal system the processors can run different or the same protocols or even no protocol, See Column 7:17-30)**; wherein the one or more route databases maintained in the data

storage medium of first one of the routing protocol computing entities contain information on at least one route for which there is no information in the one or more route databases maintained in the data storage medium of the second one of the routing protocol computing entities.**(See Figure 2 and Column 8:1-15; See also Figure 3 and for instance Route Data B is not contained in Control Card L1A/RPA.** ***Agarwal teaches in column 3:63-67 that each protocol on each processor generates protocol specific unique route information. Agarwal further shows in column 4:1-7 in item c that each processor running unique protocol exchanges data to form the master routing database. Agarwal in fact shows that in Column 3:9-11 that each processor has a copy of the master database which is created and synchronized by the exchange of protocol specific route data between the processors. At this point it is obvious that two forms of route information are generated and stored in each processor. The first is the local route information that has to be provided to all other processors running a complement of protocols different from the protocol on the processor that generated the local route information. Since the local route information has to be provided to other processors upon request it has to be stored. Whether the local route information is stored in a table or file or database is immaterial. Agarwal further provides support in Column 6:20-25 in item 3 that two separate database route information is created in each processor.)***

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsukakoshi's clustered router by causing routing protocol

computing entity to effect management of one or more peering sessions with remote routing devices according to the routing protocol in the set associated with routing protocol computing entity, the management of one or more peering sessions comprising maintaining in the data storage medium one or more route databases; wherein the routing protocol associated with a first one of the routing protocol computing entities is the same as the routing protocol associated with a second one of the routing protocol computing entities; wherein the one or more route databases maintained in the data storage medium of first one of the routing protocol computing entities contain information on at least one route for which there is no information in the one or more route databases maintained in the data storage medium of the second one of the routing protocol computing entities. The motivation being to provide a method for all distribution and synchronization of the routing database and forwarding table to a large number of entities within a distributed processor environment of a scalable router as stated in Agarwal in Column 3:19-22.

5. Regarding **claim 2**, Tsukakoshi discloses a router wherein each routing protocol computing entity is operative to maintain simultaneously a plurality of peering sessions with remote routing devices. **(Column 2, Lines 11-15; Column 3, Lines 62-67; and Column 4, Lines 1-5)**

6. Regarding **claim 3**, Tsukakoshi discloses a router wherein each routing protocol computing entity is operative to exchange data with a remote routing device through the I/O interface layer during a peering session. **(Column 2, Lines 11-15; Column 3, Lines 62-67; and Column 4, Lines 1-5)**

7. Regarding **claim 4**, Tsukakoshi discloses a router, wherein the peering session includes a transfer of route information data from the router to a remote routing device. **(Column 2, Lines 11-15; Column 3, Lines 62-67; and Column 4, Lines 1-5)**

8. Regarding **claim 5**, Tsukakoshi discloses a router, wherein the peering session includes a transfer of route information data from the remote routing device to the router. **(Column 2, Lines 11-15; Column 3, Lines 62-67; and Column 4, Lines 1-5)**

9. Regarding **claim 6**, Tsukakoshi disclose a router, wherein the data storage medium **(element 42 in Figure 4)** of at least one of the plurality of routing protocol computing entities, stores a local routing table **(element 17, in Figure 1)** holding at least one inbound route database derived at least in part from route information data transferred from a remote routing device **(element 25 in Figure 1)** to the router. **(Column 3, Lines 23-27;Column 4, Lines 44-52)**

10. Regarding **claim 7**, Tsukakoshi discloses a router wherein at least one of the plurality of routing protocol computing entities is operative to apply an inbound policy processing on the route information data transferred from a remote routing device during generation of at least one inbound route database. **(Column 3, Lines 23-27;Column 4, Lines 44-52; This is strictly a function of the routing protocol. This is implemented with a policy based routing protocol like BGP. Tsukakoshi's device can work with any routing protocol including BGP. Further Examiner takes Official Action on that a BGP is a policy based routing protocol.)**

11. Regarding **claim 8**, Tsukakoshi discloses a router wherein the data storage medium of at least one of the plurality of routing protocol computing entities stores a

routing table that holds a best route database, at least one routing protocol computing entity being operative to apply an outbound policy processing on its best route database to generate at least one outbound route database, at least one routing protocol computing entity being operative to transfer route information data from the outbound route database to a remote routing device. **(Tsukakoshi Column 3, Lines 23-27;Column 4, Lines 44-52; This is strictly a function of the routing protocol. This is best implemented with a policy based routing protocol like BGP. Tsukakoshi's device can work with any routing protocol including BGP. Further Examiner takes Official Action on that a BGP is a policy based routing protocol.)**

12. Regarding **claim 9**, Tsukakoshi discloses, wherein the data storage medium **(element 42, Figure 4)** of each routing protocol computing entity stores a routing table **(element 17, Figure 1)** holding at least one inbound route database derived from route information data transferred from a remote routing device **(Tsukakoshi element 25, Figure 1)** to the router. **(Column 3, Lines 23-27, Column 4, Lines 44-52)**

13. Regarding **claim 10**, Tsukakoshi discloses a router, wherein each routing protocol computing entity is operative to apply an inbound policy processing on the route information data transferred from a remote routing device during generation of at least one inbound route database. **(Tsukakoshi Column 3, Lines 23-27;Column 4, Lines 44-52; This is strictly a function of the routing protocol. This is implemented with a policy based routing protocol like BGP. Tsukakoshi's device can work with any routing protocol including BGP. Further Examiner takes Official Action on that a BGP is a policy based routing protocol.)**

14. Regarding **claim 11**, Tsukakoshi discloses a router, wherein the routing table of the routing protocol computing entity holds a best route database, the routing protocol computing entity being operative to apply an outbound policy processing on the best route database to generate at least one outbound route database, each routing protocol computing entity being operative to transfer route information data from the outbound route database to a remote routing device. **(Tsukakoshi Column 3, Lines 23-27;Column 4, Lines 44-52; This is strictly a function of the routing protocol. This is best implemented with a policy based routing protocol like BGP. Tsukakoshi's device can work with any routing protocol including BGP.)**

15. With respect to **claims 8-11**, Tsukakoshi fails to expressly teach a router that has a routing protocol computing entity with its own local routing table.

Agarwal teaches a router that has a routing protocol computing entity with its own local routing table. **(See Figure 4, elements A and B)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsukakoshi's router by using a routing protocol computing entity with its own local routing table. The motivation being it further enhances modularity by isolating a given protocol to a specific processor and limits the failure recovery impact of the computing means in that only the local data associated with the computing entity is rebuilt.

16. Regarding **claim 12**, Tsukakoshi discloses, wherein the routing layer includes a control computing entity in data communicative relationship with each routing protocol

computing entity (**See Column 4, Lines 39-52**), and the control computing entity includes:

a. a CPU **(See element 41 in Figure 4)**;

b. a data storage medium in communication with the CPU **(See element 42 in Figure 4)**;

C. a program data for execution by the CPU**(it is inherent for any processor designed to execute a series of procedures to store the instructions for the program executions in memory and in this case the program data has to be stored in the storage medium shown in Figure 4 as element 42);**

d. a master routing table stored in the data storage medium **(See element 17 in Figure 1; Column 4, Lines 50-52).**

17. Regarding **claim 13**, Tsukakoshi discloses a router, wherein the program data stored in the data storage medium of the control computing entity implements a routing table manager for managing the master routing table. **(It is inherent for any processor designed to execute a series of procedures to store the instructions for the program executions in memory and in this case the program data has to be stored in the storage medium shown in Figure 4 as element 42. The routing table has to be managed by the program data to determine when to read from and write to the table)**

18. Regarding **claim 14**, Tsukakoshi discloses a router, wherein each routing protocol computing entity is in communication with the control computing entity to transfer to the data storage medium of the control computing entity data from at least

one inbound route database in the routing protocol computing entity. **(Column 3, Lines 18-27)**

19. Regarding **claim 15**, Tsukakoshi discloses a router, wherein the routing table manager is operative to apply a master policy processing on data received from the inbound route database in each routing protocol computing entity to generate the master routing table. **(Column 3, Lines 31-57; In Tsukakoshi's clustered router each routing table is a master routing table as each table gets updated with new route info using the NISP protocol. In case of failure the routing table located in the backup unit will be up to date when the unit is activated)**

20. Regarding **claim 16**, Tsukakoshi discloses a router; wherein the master policy processing includes merging the data in the inbound route databases from at least two of the routing protocol computing entities to produce merged inbound routing data. **(If the routing protocol is the same for the two entities then the data has to be merged and if the protocols are different the occurrence of a uniform merging is not necessarily true. This is also a function of policy based routing protocols like the BGP.)**

21. Regarding **claim 17**, Tsukakoshi discloses a router, wherein the merged inbound routing data includes information mapping destinations and routes to the destinations. **(Column 3, Lines 23-27; This is standard information contained in most routing data.)**

22. Regarding **claim 18**, Tsukakoshi discloses a router, wherein the merged inbound routing data includes a plurality of destinations and a set of routes associated with each

destination of the plurality of destinations, the master policy processing includes discarding from each set of routes a plurality of routes and retaining only a subset of the set of routes. **(This is strictly a function of the routing protocol chosen. Tsukakoshi's clustered can accommodate any routing protocol. For instançe BGP is a policy based routing protocol that selects best routes on the values of the BGP attributes and Examiner takes Official Action on this issue.)**

23. Regarding **claim 19,** Tsukakoshi discloses a router, wherein the control computing entity is operative to transfer to the data storage medium of the first one of the routing protocol computing entities at least a portion of the master routing data to form the best route database in the data storage medium of the first routing protocol computing entities. **(See Column 3, Lines 18-20; Note that determining the best route is a function of the routing protocol like BGP and not the actual router)**

24. Regarding **claim 20**, Tsukakoshi discloses a router, wherein the control computing entity is operative to transfer to the data storage medium of a second one of the routing protocol computing entities at least a portion of the master routing data to form the best route database in the data storage medium of the second one of the routing protocol computing entities. **(See Column 3, Lines 18-20; Note that determining the best route is a function of the routing protocol like BGP and not the actual router.)**

25. Regarding **claim 21**, Tsukakoshi discloses a router, wherein each I/O controller includes a forwarding processor, when a data packet is received at the I/O controller, the forwarding processor determines an I/0 port of the interface layer through which the

data packet is to be released, where the forwarding processor including a data storage medium holding a forwarding table, and the forwarding table includes data derived from the master routing table. **(Column 4, Lines 53-64)**

26. Regarding **claims 52 and 54**, Tsukakoshi discloses a router layer, comprising: a control computing entity in data communicative relationship with each routing protocol computing entity, the computing entity including:

i. a CPU**(See Tsukakoshi element 41, Figure 4)**;

ii. a data storage medium in communication with the CPU of the control computing entity**(See Tsukakoshi element 42, Figure 4)**;

iii. a master routing table stored in the data storage medium of the control computing entity, where the master routing table holding a master routing database derived at least in part from the inbound routing database of the first routing protocol computing entity and from the inbound routing database of the second routing protocol computing entity**(See Tsukakoshi element 17 in Figure 1; Column 4, Lines 50-52; Column 3, Lines 20-30 and Column 10, Lines 20-25)**;

iv. program data in the data storage medium of the control computing entity for execution by the CPU of the control computing entity to implement a main routing table manager to manage the master routing table **(it is inherent for any processor designed to execute a series of procedures to store the instructions for the program executions in memory and in this case the program data has to be stored in the storage medium shown in Figure 4 as**

element 42. The routing table has to be managed by the program data to determine when to read from and write to the table. However, Ichinohe teaches expressively a routing table manager in Figure 1 with elements 103 and 104.);

a backup computing entity, in data communicative relationship with the first and second routing protocol computing entities and with the control computing entity **(See Tsukakoshi Figure 18; Column 10, Lines 6-25),** and the backup computing entity includes:

i. a CPU**(See element 41, Figure 4)**;

ii. a data storage medium in communication with the CPU of the backup computing entity**(See element 42, Figure 4)**;

iii. program data in the data storage medium of the backup computing entity for execution by the CPU of the backup computing entity to implement a main routing table manager **(it is inherent for any processor designed to execute a series of procedures to store the instructions for the program executions in memory and in this case the program data has to be stored in the storage medium shown in Tsukakoshi Figure 4 as element 42. The routing table has to be managed by the program data to determine when to read from and write to the table)**;

iv. the backup computing entity being responsive to an operational failure of the control computing entity **(See Tsukakoshi Column 10, Lines 30-60)** to:

1. download the inbound routing databases from each routing protocol computing entities(**Tsukakoshi Column 10, Lines 48-53)**;

2. re-build the master routing database at least in part from the inbound routing databases downloaded from each routing protocol computing entities **(See Tsukakoshi Column 10, Lines 53-57)**.

27. Regarding **claims 53 and 55**, Tsukakoshi discloses a router layer, comprising: a control computing entity in data communicative relationship with each routing protocol computing entity, the computing entity including: **(See Tsukakoshi Column 4, Lines 39-52)**

i. a respective CPU **(See Tsukakoshi element 41, Figure 4)**;

ii. a respective data storage medium in communication with the CPU**(See Tsukakoshi element 42, Figure 4)**;

iii. a master routing table stored in the data storage medium of the control computing entity, where the master routing table holding a master routing database derived at least in part from the inbound routing database of the first routing protocol computing entity and from the inbound routing database of the second routing protocol computing entity**(See Tsukakoshi element 17 in Figure 1; Column 4, Lines 50-52; Column 3, Lines 20-30 and Column 10, Lines 20-25)**;

a backup computing entity, in data communicative relationship with the first and second routing protocol computing entities and with the control computing entity **(See**

Tsukakoshi Figure 18; Column 10, Lines 6-25), and the backup computing entity includes:

i. a CPU(**See Tsukakoshi element 41, Figure 4)**;

ii. a data storage medium in communication with the CPU of the backup computing entity(**See Tsukakoshi element 42, Figure 4)**;

iii. the backup computing entity being responsive to an operational failure of the control computing entity **(See Tsukakoshi Column 10, Lines 30-60)** to:

1. transfer information from the master routing table to the data storage medium of the backup computing entity to re-build at least partially the local routing table of the first routing protocol computing entity(**See Column 10, Lines 33-36; Tsukakoshi discloses that the active-state route calculation unit sends update information to the backup-state route calculation unit. When the backup-state becomes active it is able to re-build the routing table as it has all the necessary updates till the last moment before the active unit failed. Also worth noting that in Tsukakoshi's system the active unit routing table and the backup unit routing table are always synchronized and up to date and can all be considered as the universal master routing tables.)**

2. enable the program data in the data storage medium of the backup computing entity to effect management of one or more peering sessions with remote routing devices according to a first routing protocol. **(It has already been established by Tsukakoshi that the clustered router can**

have a peering session with remote devices using the first and/or second protocol means. The backup computing entity will not establish any peering session when it is on stand by mode as it is a spare entity. However, once the backup unit becomes an active computing entity it can readily establish a peering session with external devices using steps taught by Tsukakoshi. See also Column 2, Lines 11-15; Column 3, Lines 62-67; Column 4, Lines 1-5; Column 10, Lines 6-25);

28. With respect to **claims 52-55**, Tsukakoshi fails to expressly teach a router that has a routing protocol computing entity with its own local routing table.

Agarwal teaches a router that has a routing protocol computing entity with its own local routing table. **(See Figure 4, elements A and B)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsukakoshi's router by using a routing protocol computing entity with its own local routing table. The motivation being it further enhances modularity by isolating a given protocol to a specific processor and limits the failure recovery impact of the computing means in that only the local data associated with the computing entity is rebuilt.

29. Regarding **claims 22, 50 and 51**, Tsukakoshi discloses a router; wherein the subset of protocols associated with the first routing protocol computing entity is different from the subset of protocols associated with the second routing protocol and further discloses any protocol can be used and mentions the RIP protocol as an example.

(Column 3, Lines 18-23; Column 6, Lines 1-10; Tsukakoshi's router is not limited by the type of the routing protocol chosen.)

Tsukakoshi, however, fails to expressly disclose that routing protocols can be OSPF and BGP. Further, Tsukakoshi fails to expressly disclose that only one routing protocol can run on a protocol computing entity. Even further, Tsukakoshi's fails to disclose two protocol computing entities can have mutually exclusive sets of protocols.

Agarwal discloses that routing protocols can be OSPF and BGP **(See Column 7:21)**. Agarwal discloses that only one routing protocol running on a protocol computing entity **(See Figure 2 and Column 8:1-15)**. Agarwal discloses two protocol computing entities can have mutually exclusive sets of protocols. **(See Column 54, Lines 4-7 and 30-43 and Column 5, Lines 20-27. See also in Figures 1, 10, 12, and 14, processors 113, 114, 203, and 204)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsukakoshi's clustered router to use OSPF and BGP as routing protocols. The motivation being it provides peering sessions with networks based on these protocols and such sessions with these networks are beneficiary as theses networks running OSPF and BGP protocols are widely deployed and make up part of what is known as the Internet.

30. Regarding **claims 24, 30, and 56**, Tsukakoshi discloses a router, wherein the first routing protocol and the second routing protocol are distance vector protocols. **(Column 3, Lines 18-23; Column 6, Lines 1-10; Tsukakoshi's router is not limited by the type of the routing protocol chosen.)**

31. Regarding **claim 25**, Tsukakoshi discloses a router, wherein the first routing protocol and the second routing protocol are link state protocols. **(Column 3, Lines 18-23; Column 6, Lines 1-10; Tsukakoshi's router is not limited by the type of the routing protocol chosen.)**

32. Regarding **claims 26-29** Tsukakoshi discloses all aspects of the claimed invention as set forth in the rejection of claim 24 but does not disclose how at least one of the remote devices forming a peering session with the first routing protocol computing entity can be prevented from forming any peering session with the second routing protocol entity.

Agarwal discloses wherein the first routing protocol computing entity is capable of establishing peering sessions with a first set of remote routing devices, the second routing protocol computing entity is capable of establishing peering sessions with a second set of remote routing devices, the first set of remote routing devices excluding at least one routing device that belongs to the second set of routing devices, wherein the first set of remote routing devices excludes any remote routing device from the second set. **(See Figures 2, 3, and 6 and Column 8:16-42. Agarwal router uses registration process to exclude routers from peering session. See Column 10:20-35. Agarwal routing protocol computing entities run different routing protocols including BGP as stated in Column 7:20. Examiner takes Official Notice that authentication and filtering can be implemented at the routing protocol level using features of BGP and DDOS squelch protocols as detailed in Anderson et al (US Pub. No. 2003/0014665))**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsukakoshi's router wherein the first routing protocol computing entity is capable of establishing peering sessions with a first set of remote routing devices, the second routing protocol computing entity is capable of establishing peering sessions with a second set of remote routing devices, the first set of remote routing devices excluding at least one routing device that belongs to the second set of routing devices. The motivation is to provide authentication means to identify routers that are registered to receive routing data in order to provide a method for all distribution and synchronization of the routing database and forwarding table to a large number of entities within a distributed processor environment of a scalable router as stated in Agarwal in Column 3:19-22.

33. Regarding **claim 59**, Tsukakoshi fails to disclose a router, wherein the transferring comprises transferring the at least a portion of the merged routing data to the data storage medium of each of the routing protocol computing entities.

Agarwal discloses a router, wherein the transferring comprises transferring the at least a portion of the merged routing data to the data storage medium of each of the routing protocol computing entities. **(See Column 6:46-67 and Column 7:1-5)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsukakoshi's clustered router wherein the transferring comprises transferring the at least a portion of the merged routing data to the data storage medium of each of the routing protocol computing entities. The motivation being to provide a method for all distribution and synchronization of the routing

database and forwarding table to a large number of entities within a distributed processor environment of a scalable router as stated in Agarwal in Column 3:19-22.

34. Regarding **claim 60**, Tsukakoshi fails to disclose a router wherein the merged routing data includes data regarding destinations and routes for the destinations, including, for each of at least one of the destinations, a plurality of routes for that destination.

Agarwal discloses disclose a router wherein the merged routing data includes data regarding destinations and routes for the destinations, including, for each of at least one of the destinations, a plurality of routes for that destination. **(See Column 6:40-45)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsukakoshi's clustered router wherein the merged routing data includes data regarding destinations and routes for the destinations, including, for each of at least one of the destinations, a plurality of routes for that destination. The motivation being it eases routing incoming packets for the I/O controller or forwarding unit, which is the Line Card in Agarwal's system.

35. Regarding **claim 61**, Tsukakoshi fails to disclose a router, wherein the router is operative for, prior to the transferring, pruning the merged routing data by retaining, for each destination, at most a set number of routes for that destination.

Agarwal discloses a router, wherein the router is operative for, prior to the transferring, pruning the merged routing data by retaining, for each destination, at most a set number of routes for that destination. **(See Column 6:64-67)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsukakoshi's clustered router wherein the router is operative for, prior to the transferring, pruning the merged routing data by retaining, for each destination, at most a set number of routes for that destination. The motivation being in order to save space of storing data and time for accessing data only a necessary subset of data is forwarded to the forwarding tables.

36. Regarding **claim 62**, Tsukakoshi fails to disclose a router wherein the pruning comprises pruning the merged routing data based on a preference attribute associated with each of the routes.

Agarwal discloses a router wherein the pruning comprises pruning the merged routing data based on a preference attribute associated with each of the routes. **(See Column 6:46-67 and Column 7:1-5)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsukakoshi's clustered router wherein the pruning comprises pruning the merged routing data based on a preference attribute associated with each of the routes. The motivation being in order to save space of storing data and time for accessing data only a necessary subset of data is forwarded to the forwarding tables.

37. Regarding **claims 63 and 67**, Tsukakoshi fails to disclose a router wherein routing layer includes a control computing entity in data communicative relationship with each of the routing protocol computing entities, the control computing entity including: a CPU; and a data storage medium in communication with the CPU of the control

computing entity and storing program data for execution by the CPU of the control computing entity to cause said control computing entity to effect the merging and the transferring.

Agarwal discloses a router wherein routing layer includes a control computing entity in data communicative relationship with each of the routing protocol computing entities, the control computing entity including: a CPU **(See Figures 1 A, B, C; and Column 7:17-25 all routing protocol computing entities, L1s are processor based. Any L1 registered as a server and client with all L1s can be considered a control computing entity as illustrated in the transaction in Column 8:16-41)**
a data storage medium **(inherent for the system shown in Figure 4 having a routing table)** in communication with the CPU of the control computing entity and storing program data for execution by the CPU of the control computing entity to cause the control computing entity to effect the merging and the transferring **(See Column 6:46-67)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsukakoshi's clustered router wherein routing layer includes a control computing entity in data communicative relationship with each of the routing protocol computing entities, the control computing entity including: a CPU; and a data storage medium in communication with the CPU of the control computing entity and storing program data for execution by the CPU of the control computing entity to cause said control computing entity to effect the merging and the transferring. The motivation being to provide a method for all distribution and synchronization of the

routing database and forwarding table to a large number of entities within a distributed processor environment of a scalable router as stated in Agarwal in Column 3:19-22.

38. Regarding **claim 35**, Tsukakoshi teaches a router, comprising:

a. an interface layer including a plurality of I/O controllers, each I/O controller implementing an I/O port (**See Figure 1, element 18; Figure 4, element 18;Column 4, Lines 53-64; Each forwarding unit acts as an I/O controller determining what to transmit, re-transmit, accept and reject from the incoming and outgoing packet traffic. Each forwarding unit has to have at least one I/O interface or port to send to and receive packets from external routers like router 25 in Figure 1)**;

b. a switching layer **(See Figure 1, element 13 and Figure 4, element 46)** in communication with the interface layer for selectively establishing signal pathways between the I/O ports **(See Figure 1, element 13; Figure 4, elements 18 and 46; See Column 4, Lines 39-43 to see how the switch layer interfaces with the forwarding units that act as I/O controllers. Column 4, Lines 53-64 indicates that each forwarding unit acts as an I/O controller determining what to transmit, re-transmit, accept and reject from the incoming and outgoing packet traffic. Each forwarding unit has to have at least one I/O interface or port to send to and receive packets from external routers like router 25 in Figure 1)**;

c. a routing layer **(Figure 1, element 20)** in communication with the interface layer **(Figure 1, element 18)**, the routing layer being capable of managing at least one peering session with a remote routing device, **(See Figures 10-13)** the peering session including the exchange of messages with the remote routing device through one of the

I/O controllers **(Figure 2 and Column 3, Lines 58-67)**, the peering session being comprised of plurality of tasks_**(See Figure 3 and Column 4, Lines 13-38)**;

d. the one I/O controller implementing a peer session assist module, **(This limitation is inherent because Tsukakoshi discloses like any router uses its Forwarding Unit that act as I/O controller to communicate with another remote router and there has to be peering session assist modules.)**

Tsukakoshi, however fails to expressly disclose the peering session assist module being capable of performing some of the tasks of the peering session autonomously from the routing protocol computing entity of the routing layer and the routing layer being capable of performing tasks of the peering session assist other than the tasks performed by the peering session assist module; wherein the tasks performed by the peering session assist module autonomously from the routing protocol computing entity include authenticating without intervention of the routing protocol computing entity, messages received from the remote routing device.

Agarwal discloses the peering session assist module **(In Agarwal system the peering session assist module is the Route Table Manager and resides both on the Line Cards that are effectively the I/O of the router 10 shown in Figure 1 and on the control cards; See Figures 1 and 4 and Column 6:10-30)** being capable of performing some of the tasks of the peering session autonomously from the routing protocol computing entity of the routing layer and the routing layer being capable of performing tasks of the peering session assist other than the tasks performed by the peering session assist module **(Since the Line Cards and the Controller Cards have**

their own peering session assist module in the form of Route Table Manager autonomous peering sessions are readily established as can further be verified in Figure 3 peering session between Controller cards and in Figure 6 between Line Cards, See also Column 4:14-30); wherein the tasks performed by the peering session assist module autonomously from the routing protocol computing entity include authenticating without intervention of the routing protocol computing entity, messages received from the remote routing device. **(See Figure 6 and Column 10:20-35, Agarwal shows those who are not registered are denied service in this embodiment which is a form of authentication and also shows at the I/O level which is at the Line card registration and authentication of registered members occurs independent of the routing layer.)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsukakoshi's clustered router by having the peering session assist module being capable of performing some of the tasks of the peering session autonomously from the routing protocol computing entity of the routing layer and the routing layer being capable of performing tasks of the peering session assist other than the tasks performed by the peering session assist module; wherein the tasks performed by the peering session assist module autonomously from the routing protocol computing entity include authenticating without intervention of the routing protocol computing entity, messages received from the remote routing device. The motivation being to provide a method for all distribution and synchronization of the routing

database and forwarding table to a large number of entities within a distributed processor environment of a scalable router as stated in Agarwal in Column 3:19-22.

39. **Claims 38 and 41** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukakoshi et al (US 6, 577, 634), hereinafter referred to as Tsukakoshi, in view of Fukushima et al (US 6, 049, 524), hereinafter referred to as Fukushima and Basso et al (US 7, 003, 582), hereinafter referred to as Basso.

40. Regarding **claim 38**, Tsukakoshi teaches a router, comprising:

a. an interface layer including a plurality of I/O controllers, each I/O controller implementing an I/O port (**See Figure 1, element 18; Figure 4, element 18;Column 4, Lines 53-64; Each forwarding unit acts as an I/O controller determining what to transmit, re-transmit, accept and reject from the incoming and outgoing packet traffic. Each forwarding unit has to have at least one I/O interface or port to send to and receive packets from external routers like router 25 in Figure 1)**;

b. a switching layer in communication with the interface layer for selectively establishing signal pathways between the I/O ports (**See Figure 1, element 18; Figure 4, element 18;Column 4, Lines 53-64; Each forwarding unit acts as an I/O controller determining what to transmit, re-transmit, accept and reject from the incoming and outgoing packet traffic. Each forwarding unit has to have at least one I/O interface or port to send to and receive packets from external routers like router 25 in Figure 1)**;

c. a routing layer in communication with the interface layer (**See Column 4, Lines 39-52)**;

Tsukakoshi, however, fails to expressly disclose that a routing protocol implemented in a route calculating entity can be a Link State protocol.

Basso teaches that a routing protocol implemented in a route calculating entity can be a Link State protocol. **(OSPF is a link state protocol and is shown in Figure 2, element 26. See also Column 3, Lines 22-25)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsukakoshi's clustered router to use routing protocol entities where each entity runs a link state protocol such as OSPF. The motivation being it provides modularity by isolating a given protocol to a specific processor and OSPF is the most widely deployed link state protocol.

Tsukakoshi, however, fails to disclose I/O controller implementing an LSA entity including an LS database.

Fukushima teaches a multiplex router device, shown in figure 2, and it is identical to that of Tsukakoshi's clustered router device, which is shown in Figure 14. Fukushima teaches that his system can implement Link State protocol as one of the routing protocols and is indicated by element 22 in Figure 2. **(See also Column 5, Lines 50-75 and Column 6, Lines 1-5)**

Fukushima discloses each I/O controller **(i.e. Forwarding Unit)** implements an LSA entity, where the LSA entity includes an LS database **(See Element 19 in Figure 2; Column 6, Lines 7-11; Since Fukushima teaches that the routing protocol is a link state protocol there has to be an LSA entity in both the router and I/O Controller layers. Further more, replacing the LS database centrally located in**

the routing layer to a distributed LS database is obvious to one ordinarily skilled in the art if the goal is not to have a single point of failure.), and the LSA entity is responsive to an LSA message from a remote routing device **(Column 1, Lines 53-57)** including LS information to:

i. update the LS database **(Column 1, Lines 66-67 and Column 2, Lines 1-7)**;

ii. forward the LS information to the routing layer **(Column 2 Lines 1-20 and 32-43)**;

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsukakoshi's clustered router to use the link state protocol as the routing protocol with the I/O controller implementing an LSA entity including an LS database, the motivation being to minimize the amount of information being sent to the standby mode routing calculation unit. If the link state protocol is used as the routing protocol then only the link state information can be sent to the routing calculation unit in standby mode thereby minimizing internal traffic between the active and standby units as further discussed in Fukushima Column 4, Lines 34-38.

41. Regarding **claim 41**, Tsukakoshi teaches all aspects of the claimed invention as set forth in the rejection of claim 38 but fails to teach a routing layer that includes a main control computing entity and a backup computing entity with each entity with its own routing table manager.

Fukushima teaches a routing layer that includes a main control computing entity and a backup computing entity with each entity with its own routing table manager. Specifically Fukushima teaches a router, wherein the routing layer includes:

a. a control computing entity in data communicative relationship with each I/O controller **(element 13 in Figure 14)**, where the control computing entity**(element 11 in Figure 14)**, includes:

i. a CPU **(element 40 in Fig.14)**;

ii. a data storage medium in communication with the CPU **(element 41 in Figure 14)**;

iii. a master routing table stored in the data storage medium, where the master routing table holding a master routing database derived at least in part from the LS database of at least one of the I/O controllers **(elements 19 in Figure 2; Column 2, Lines 4-7 and 40-42; Column 5, Lines 51-67 and Column 6, Lines 1-11)**;

iv. a program data in the data storage medium to implement a main routing table manager to manage the master routing table **(element 18 in Figure 2; Column 5, Line 66)**;

b. a backup computing entity in data communicative relationship with at least one of the I/O controller, where the backup computing entity **(Column 7, Lines 30-45; Fukushima discloses that the backup or standby computing entity is identical to the active entity shown in Figure 2. Therefore the active and backup entities have identical hardware setup.)** including:

i. a CPU **(element 40 in Fig.14)**;

ii. a data storage medium in communication with the CPU of the backup computing entity; **(element 41 in Fukushima's figure 14)**;

iii. program data in the data storage medium of the backup computing entity for execution by the CPU of the backup computing entity to implement a main routing table manager **(element 18 in Fukushima's Figure 2; Column 5, Line 66)**;

iv. the backup computing entity being responsive to an operational failure of the control computing entity **(Column 7, Lines 46-52)** to:

1. transfer information from at least one of the I/O controllers to re-build the LS database **(Column 7, Lines 53-67)**;

2. enable the program data in the data storage medium of the backup computing entity to act as a main routing table manager **(Column 7, Lines 46-52; Once the standby unit becomes active it becomes the main routing table manager**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsukakoshi's clustered router to use a routing layer that includes <u>a main control computing entity</u> and <u>a backup computing entity</u> with each entity with its own routing table manager, the motivation being minimizing communication disruptions when a computing entity experiences failure.

42. **Claims 39 and 40** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukakoshi, in view of Fukushima and Basso as applied to claim 38, in further view of Zinin et al (US 6, 820, 134), hereinafter referred to as Zinin.

43. Regarding **claim 39**, the combination of Tsukakoshi, Basso, and Fukushima teaches all aspects of the claimed invention as set forth in the rejections of claim 38

including the existence of an LSA entity. However the modified invention of Tsukakoshi, Basso, and Fukushima fails to teach that, the router upon receiving an LSA message, it will verify whether the LS information is present or not in the LS database and consequently takes appropriate action.

Zinin teaches that when an entity receives an LSA message then it needs to check whether the LS information is present or not in the LS database and update the database if the info exists or discard the LSA if the info already exists in the LS database. **(Column 8, Lines 59-60 and Column 11, Lines 5-10)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the modified invention of Tsukakoshi's, Basso's and Fukushima's clustered router to use the link state protocol as the routing protocol and verify if the LS information is present in the LS database, the motivation being minimizing the amount of information being sent to the router. If the link state protocol is used as the routing protocol then only the link state information can be sent to the routing calculation unit in standby mode thereby minimizing internal traffic between the active and standby units. Also it allows an efficient flooding system resulting in conserving bandwidth and speeding the router.

44. Regarding **claim 40**, the modified invention of Tsukakoshi, Basso, and Fukushima as taught above disclosed the aforementioned invention including the existence of an LSA entity. It also disclosed that the LSA entity **(LSA entity is simply the ability to handle LS protocol at the forwarding unit)** is responsive to LS information received from any I/O controller **(i.e. forwarding unit)** and being able to

transmit the LSA message including the LS information to a remote routing device.

(Fukushima, Column 7, Lines 30-45)

Response to Arguments

45. Applicant's arguments filed on March 30, 2007 have been fully considered but they are not persuasive.

46. In the Remarks, in Section II, pages 19-24, with respect to independent claims 1, 23, and 65, Applicant argues neither Tsukakoshi nor Agarwal teaches or suggests the claimed limitation that requires each routing protocol entity running a first routing protocol maintains a routing database that contains information on at least one route for which there is no information in the databases maintained by other routing protocol entities running a routing protocol other than the first routing protocol. Further Applicant in an attempt to refute the evidence cited by the Examiner in the previous Office Action indicates that Agarwal's Figure 3 fails to teach the claimed limitation. Applicant argues that Figure 3 is a simplified version of the routing update mechanism and in that the end product of Figure 3 is that each processor ends up with a master database containing route data from the full complement of routing protocols.

Examiner respectfully disagrees with Applicant conclusions. There is no dispute between the Applicant's point of view and Examiner's position regarding the fact that

each routing protocol entity or processor in Agarwal's system generates local route information data that is unique to the protocol running on the processor. This is further illustrated in Agarwal's Columns 3:63-67 and 6:20-25. In fact the Applicant agrees with this point of view in the Remarks on page 23 with respect to Figure 3 that protocol A generates Route Data A and protocol B generates Route Data B. The real issue is how local route information data that is unique to the protocol running on the processor such as Route Data A and Route Data B is stored. Applicant's main argument centers around the fact that even though each processor generates local unique routing information associated with the protocol it is running, the final master database on each processor contains routing information associated with the full complement of routing protocols running on all processors. Assuming for a moment the Applicant's argument is valid such a limitation is not at all patentable because the local routing information data is generated and available and how and where it is stored is irrelevant. The Applicant has not shown in the Remarks and in the Specification the criticality of storing such a data separately in a database. However, the Examiner still disagrees with the Applicant's conclusions because Agarwal still adequately meets the claimed limitation. The reason why Agarwal meets the claimed limitation is simply because each processor has to separately store the generated local unique routing information associated with the protocol on the processor because such a data has to be continuously and readily available for other processors seeking resynchronization of master database. The correctness of the Examiner's position can easily be verified when a new processor is added to the system.

47. In the Remarks, in Section II, pages 25-27, with respect to independent claim 35, Applicant argues that Agarwal falls to teach the claimed limitation that requires an I/0 controller of an interface layer of a router that implements a peering session assist module capable of authenticating, without intervention of a routing protocol computing entity of a routing layer of the router, messages received from a remote routing device during a peering session between the router and the remote routing device. Applicant main argument revolves around the definition of peering session. Applicant contends the definition of peering is well known in the art and provides a definition based on specification and indicates on page 26 of the Remarks that peering refers to communication of route information between routers through routing protocols. Hence Applicant concludes that Agarwal fails to teach peering as the communication of routing information occurs within a single router.

Examiner respectfully disagrees with Applicant's conclusions. Agarwal teaches a scalable routing system which is a conglomerate of routers clustered together just like Tsukakoshi 's teachings. The exchange of routing information between the routing protocol entities adequately meets Applicant's definition of peering session. However, Agarwal teaches in Column 2:10-30 peering session between two different routers in a network and it is very obvious to one having ordinary skill in the art that the peering session that occurs between two processors in order to exchange protocol specific routing data in Agarwal scalable router system can be carried to a peering session between Agarawl's router and a BGP router.

48. In the Remarks, in Sections II & III, pages 27-31, with respect to independent claim 38, Applicant argues that Fukushima teaches LS database in the routing layer and not in the interface layer. Further Applicant argues the routing table 19 in Fukushima's forwarding unit 13 cannot be a LS database mainly because it is as an industry standard not to mix state of links with information on routes. Further, Applicant argues back that the Examiner's position, communicated in the last office Action regarding the LS database can be distributed on both the routing and interface layers to prevent a single point of failure as being obvious, is not practical because Fukushima has already provided a solution for a single point of failure.

Examiner respectfully disagrees with Applicant's conclusions. The first reason provided by the Applicant why the routing table 19 in Figure 2 is not LS database relies on the assumption that a routing table and routing database cannot contain link state information simply because it is not a standard accepted by the industry. Examiner disagrees with Applicant's industry based categorization of routing database containing only route info and not link state info by simply citing Agarwal Column 2:22-30 as Agarwal vividly contradicts Applicant's industry based opinion on what a routing database should contain. The second reason provided by Applicant why the routing table 19 in Figure 2 is not LS database relies on Fukushima's disclosure that states the routing table 19 is created from Link State database 22. Fukushima's disclosure at most confirms routing table 19 is a Link State database and it is a subset of Link State database 22 and does not contradict Examiner's position. Applicant's point of importing a Link State Database to the I/O layer will be redundant given the fact that

Fukushima has backup databases is irrelevant because the modification is going to occur on the primary reference (Tsukakoshi). Further more Applicant has not established the criticality of having LS database on the I/O layer as opposed to having it on the routing layer only and using Fukushima's backup system for instance.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following US and European Patent Application describes a multiple virtual router with a controlling entity:

European Patent Application (EP 0 926 859 A2) to Scott et al

US Pub. No. (2002/0141378) to Bayes et al

The following US Patent describes policy management:

US Patent (5, 889, 953) to Thebaut et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Habte Mered whose telephone number is 571 272 6046. The examiner can normally be reached on Monday to Friday 9:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris H. To can be reached on 571 272 7629. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published

applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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HM

DORIS H. TO
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600